

Bonanza!

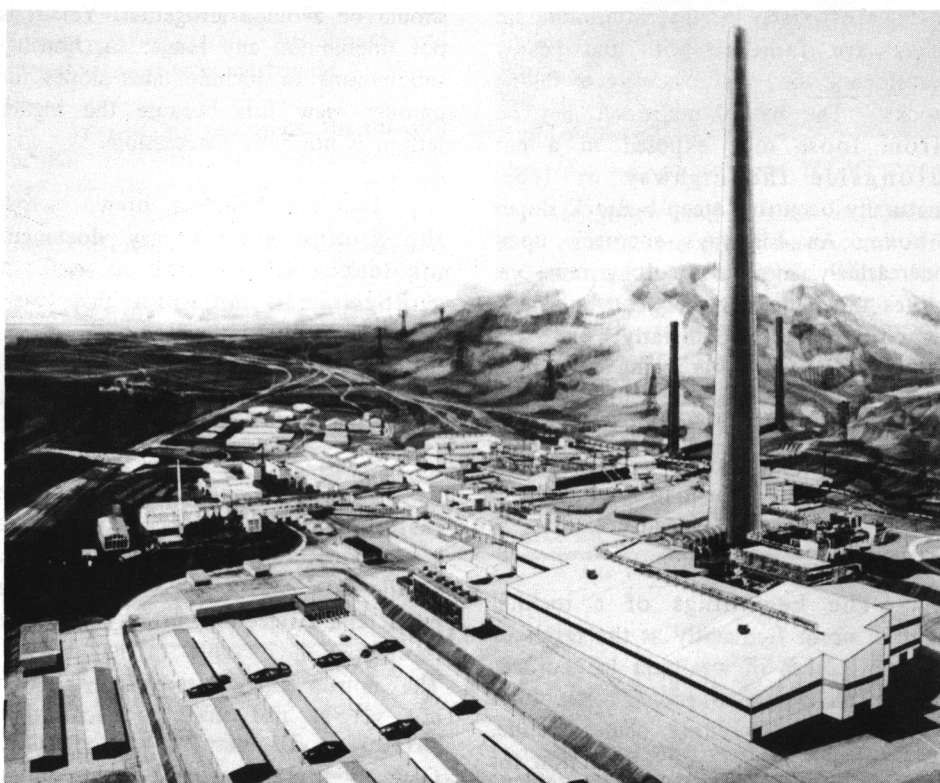
UGMS GOES TO VEGAS

The mining industry's decision-makers, over 20,000 strong, converged on Las Vegas, October 7-10, for the largest mining show and convention ever held by the American Mining Congress. The show emphasized the latest developments in mining machinery, equipment, and supplies to meet the need for productivity, safety, and environmental problems. Some 400 exhibitors introduced products and services in the fields of exploration, mining, and mineral processing.

At the convention, twenty-two separate sessions covered current technical and legislative matters affecting the industry. Particular sessions were devoted to the environment, energy, taxation, management, safety and health, federal surface mining legislation, the western coal industry, reclamation and waste disposal, and undersea mining.

Carlton Stowe represented the UGMS with a no-gadget, no-nonsense display of Utah's natural resources. Mr. Stowe handled inquiries on every facet of Utah geology. His display included mineral specimens, various maps, reports, bulletins, and special studies of the Survey. Particularly popular with many people and several eastern companies was the UGMS Monograph Series 1, 2, and 3, *Utah Coal Fields*.

Conventioneers were pleased that so much comprehensive information about the mineral activities of Utah was available just for the asking. Mr. Stowe's straight-forward approach proved to be a big hit at the AMC Mining Show 1974.



Kennecott's proposed smelter emission control facility. Note: highway, Alternate 50, at left. (Artwork courtesy of Kennecott Copper Corporation)

\$175 MILLION

Emission Control for Kennecott

Kennecott Copper Corporation officials have announced plans for a smelter emission control program costing \$175 million. Major elements of the program include extensive modification of the process gas handling equipment designed to capture pollutants, changes in the furnace area, additional sulfur collection facilities, a 1,200 foot stack and a computerized emission monitoring system to aid in controlling the level of smelter production.

Three 70-foot-long refractory lined cylindrical vessels will replace the present three reverberatory furnaces.

These vessels produce an off-gas concentration sufficiently high to be treated in acid plants for removal of sulfur dioxide. Changes in the furnace area will require installation of additional processing equipment, including concentrate driers, slag recycling equipment, pelletizing equipment and acid plant capacity.

The computer monitoring system is designed to assure compliance with air quality standards when extremely adverse meteorological conditions prevail. The system includes emission, air quality, and meteorological monitoring

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At Home With Geology

"BEWARE OF FALLING ROCKS"

by B. N. Kaliser
Chief Engineering Geologist

Motorists in the intermountain area are familiar with the yellow cautionary road sign, "beware of falling rocks." The hazard addressed may be from loose rock exposed in a cut alongside the highway or from naturally occurring steep bedrock slopes above. As highways encroach upon increasingly more difficult terrain one notes the increasing frequency of these warning signs. Similarly, one sees housing developments being placed in topographical situations that in the recent past would have been deemed ludicrous. Rockfall, heretofore gone unnoticed with respect to housing, now becomes important, indeed critical.

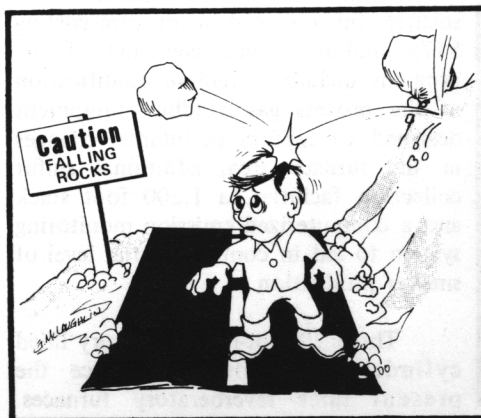
The beginnings of a rockfall hazard occur frequently as the result of natural planes of weakness in bedrock, which include such geologic structural elements as bedding planes, faults, joints, and cleavages. Intersection of these surfaces, both exposed and buried, provides the physical means for parting the blocks. In addition, weathering, particularly frost riving, separates and loosens the blocks of rock, leaving the predominant force of gravity to its devices. Finally, the threshold of stability of a perched block may be breached by vibrations, such as those emanating from earthquakes, explosions, or even sonic booms.

Accumulations of fallen blocks of rock at the foot of a slope or along a man-made bench form what are called talus, generally a quite loose and unstable deposit. To indicate the degree of hazard, a talus deposit may be analyzed for age by observation of the extent of lichen growth on individual block surfaces, the establishment of vegetation over the surface, and the shape of the deposit. Active talus

should be avoided altogether. Yet, it is not uncommon any longer for housing subdivisions to include talus slopes for premier view lots because the higher terrain is normally inaccessible.

Isolated boulders strewn across the ground surface may document incidences of rockfall as well. A geologist can distinguish this cause from that of glacial deposition, debris flow, or flood origin. The distinction should be made before acquisition of the property.

Rockfall is one geologic hazard in residential subdivisions that is quite hopeless to design against economically. Needless to say a block may have a predictable trajectory or one which is entirely unpredictable in its descent. The impact of a descending boulder not yet at rest may be more than sufficient to destroy any dwelling. Costs, however, that would be required to treat the problem would far exceed permissible costs in any housing project. Entire subdivisions in Utah await the unsuspecting by their placement in the paths of future rockfalls. Despite the pressures of family, uniqueness of site, and salesmanship of realtor, the common sense of a layman geologist must not be prevented from governing site choices for homes.



UGMS Releases Latest Studies

The Utah Geological and Mineral Survey has released two of its latest studies for sale through the UGMS Publications Office, 103 UGS Building, University of Utah, Salt Lake City, Utah 84112. When ordering by mail, add 10% for handling and mailing charges.

Bulletin #105, *Utah's Mineral Activity: An Operational and Economic Review*, by C. H. Stowe (\$2.00). The report discusses mineral activities in non-technical terms and brings accounts of mineral activity in Utah up-to-date. Complete production summaries for each year through 1964-1973, an activity review of oil and gas drilling operations, and a resume of activity within the mining industry are included. The report has 24 illustrations and 15 tables. It is also supplemented by photographs of the mineral industries of the state.

Oil and Gas Field Studies No. 13, *Anderson Junction Field*, by P. R. Peterson (\$1.50). The newly issued study provides clues in the search for the elusive petroleum deposits of the region. The study includes a map of Anderson Junction Field in Washington County.

UGA Field Trip

The 1974 field trip of the Utah Geological Association was held September 19 through 21 in the Uinta Basin with primary emphasis on energy resources. The three-day tour by bus included visits to the giant Greater Altamont-Bluebell oil field, the Asphalt Ridge oil-impregnated sandstone deposit, the prototype oil shale lease area south of Bonanza, and a trip underground in the Kaiser coal mine at Sunnyside. Other areas visited and topics discussed included undeveloped coal deposits, water and legal problems of energy development, socioeconomic impacts on the Uinta Basin, gilsonite mines and the Central Utah Project.

The guidebook for the trip, UGA Publication 4, *Energy Resources of the Uinta Basin, 1973*, will be sold by the Survey.

ANACONDA'S NEW MINE

The Anaconda Company has announced plans for a \$135 million development of their Carr Fork properties in the Pine Canyon area of the Oquirrh Mountains east of Tooele, Utah. The project will consist of a deep underground mine and a 10,000 ton per day concentrator. Construction is already underway. Production is anticipated by 1979.

Anaconda officials estimate life of the mine will exceed 20 years and will produce approximately 560,000 tons of copper yearly. Copper ore will be mined from replacement ore bodies in the Bingham Canyon limestone formation series from depths of 2,000 to 5,000 feet. A permanent work force of approximately 800 will be employed with payroll estimates reaching \$15 million per year.

Anaconda acquired the Carr Fork properties in 1948 and has conducted an exploration program since that time. Discovery of the deep Carr Fork mining reserves was made in 1969. Since then, several million dollars have been expended in delineation of the reserves and development of mining plans. Actual smelting and refining operations will be done in Anaconda, Montana, although Anaconda is considering construction of a custom smelter in Utah, depending upon the performance of the recently opened hydrometallurgical-type smelter in Montana.

UGA Elects Officers

The Utah Geological Association has elected James B. Lindsay—president, succeeding James A. Colburn. Mr. Lindsay is the owner-manager of Leerco (Lindsay Exploration Co.). Carlton Stowe, Utah Geological and Mineral Survey specialist, is vice-president; Donald T. McMillan, the director of the Utah Geological and Mineral Survey, is program director; Harry D. Goode, professor of geology at the University of Utah, is secretary; and Mary Jo Sweeney, Kennecott exploration geologist, is treasurer.

RIVERDALE MUDSLIDE

At 6:45 a. m. on October 4, 1974, the instantaneous collapse of a bluff of the Weber River in Weber County tumbled the home of Delbert Pike from its foundation. Fortunately yet surprisingly, no one was killed. Mr. Pike was able to free himself, his wife, and infant nephew from the mass of mud and debris. Unfortunately, his house and several vehicles were destroyed.

Two UGMS geologists, the director Donald McMillan and chief engineering geologist Bruce Kaliser, inspected the terrain surrounding the mudslide. They found evidence of past slide activity along the bluff, a sedimentary deposit in the Weber River delta of ancient Lake Bonneville. Patterns of tree growth in the area revealed twisted and oblique trunk deformations due to recent episodes of ground movement. They observed, too, that incipient ground failures in several places along the bluff might seriously jeopardize the soundness of the area for future construction.



View of damage to Pike home. (UGMS photo)

McMillan and Kaliser concluded that two factors might have combined to precipitate the mudslide. First, the Weber delta sediments had been saturated with an intense use of irrigation water this year because of the unusually dry summer. Secondly, the vibration of passing railroad trains—a major railroad line exists one block west of the Pike home—might have triggered the slide when water saturation had ultimately weakened the ground surface stability.

Bridge The Gap

WHY DON'T THEY LISTEN?

Merrill Haas, president of the American Association of Petroleum Geologists (AAPG), called on member geologists to "bridge the gap" between the public and the oil industry.

In his talk before the Utah Geological Association on October 25, Mr. Haas cited the public's confusion and skepticism about energy problems. The energy crisis had shocked a complacent public who turned, in bitter perplexity, on the industry as the villain for not warning it sooner. But the fault, according to Mr. Haas, lay with the public for not listening to the warnings in the past and then listening to misinformation in the present.

Mr. Haas pointed out that the serious warnings about the oil and gas shortages go back over twenty years. As early as June 1952, the Paley Commission warned of the greater demands but limited resources that would eventually raise costs and deflate our standard of living. In 1960 Mike Halbouty, a former

president of the AAPG, predicted an energy crisis by 1975. During the 1960's the dire warnings by industry's spokesmen increased.

According to Haas the problem for the oil industry today lay in the punitive attitude of the public. He blamed the news media for shaping adverse public opinion through shortsightedness found in their own limited knowledge of industry's matters and in their bias against private enterprise. He cautioned that the public's misinformation and misdirection might lead to laws that would cripple the petroleum industry and not help it through the energy crisis.

Mr. Haas asked the geologists to use their "expertise and knowledge" to keep the news media accurately informed about oil industry's affairs. He appealed to each member to be a "self-appointed truth squadron" on guard to correct misinformation and to re-establish the industry's credibility.

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networks coupled to a computerized control center where forecasts are made of conditions which can lead to concentrations in excess of the standards.

Elements of the program and their approximate costs include: engineering and development, \$12.5 million; the 1,200 foot stack, \$9 million; the flue system, \$8 million; material handling and charge-drying facilities, \$10 million; plant buildings and auxiliaries to replace existing facilities, \$3 million; increased electrical facilities, \$3 million; new furnace area, \$79 million; slag processing,

\$10 million; acid plants, \$40 million; emission monitoring system, \$0.5 million.

When the emission control program is in full operation, sulphur trioxide output will be reduced from its present level of 18 tons per day to less than 792 pounds per day. Sulphur dioxide emission will be reduced from 562 tons per day to less than 150 tons per day, most of the time. The new acid plants will increase sulphuric acid production from 1,200 tons to 2,100 tons daily.

Petroleum Award

At the 15th Annual Meeting of the Utah Petroleum Council held at the Tri-Arch Travelodge on September 18, Howard Ritzma, assistant director of the UGMS, was presented a bronze plaque inscribed "with thanks for service and dedication to industry affairs."

Replacement Map

A replacement map has been issued for the Utah Geological and Mineral Survey's *Coal Monograph Series No. 3, Central Utah Coal Fields*, pages 460 and 461. The map will be sent automatically to those who ordered the book by mail. For those who purchased the book "over the counter", please notify UGMS and the replacement map will be sent to you.

New Staff Members Assume Survey Post

Jock A. Campbell, has been employed by UGMS as petroleum geologist in charge of the Petroleum Section succeeding Howard Ritzma who has assumed the post of assistant director. Jock who is finishing his doctoral work at the University of Utah was formerly employed by Shell Oil Company in various exploration projects mostly in the southern Rocky Mountains.

Fitzhugh D. Davis joined the UGMS geological staff in July in the Urban and Engineering Geology Section. Mr. Davis comes to the Survey from the Utah Highway Department where he was employed as an engineering geologist in the materials and testing division.

WHAT HAPPENS TO A BBL OF OIL?

Shell Oil gives the following breakdown in telling what happened to one of its bbls of oil in 1973:

Product	Percent yield
Gasoline	45.6
Jet Fuel	6.8
Ethane (including ethylene)	0.2
Liquified gases	2.8
Kerosine	1.7
Distillate fuel oil	22.5
Residual fuel oil	7.7
Petrochemical feedstocks	2.9
Special naphthas	0.7
Lubricants	1.5
Wax	0.2
Coke	2.9
Asphalt	3.6
Road	0.2
Still gas	3.9
Miscellaneous	0.4
Refinery overage	-3.6
Totals	100.0

Source: Energy Information, October 16, 1974; Petroleum Information Corp.

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